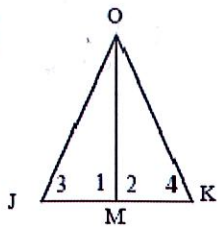


3.5 CPCTC Proofs

①



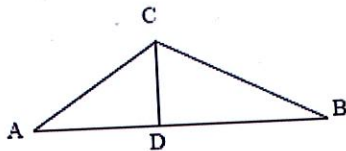
Given: $\angle 1 \cong \angle 2$

$\angle 3 \cong \angle 4$

Prove: M is the mp of \overline{JK}

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. $\angle 3 \cong \angle 4$	2. Given
3. $\overline{OM} \cong \overline{OM}$	3. Reflexive Property
4. $\triangle OMT \cong \triangle OMK$	4. AAS
5. $\overline{JM} \cong \overline{KM}$	5. corresponding parts of congruent triangles are congruent
6. M is the midpoint of \overline{JK}	6. definition of midpoint

②



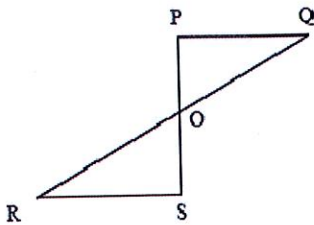
Given: $\overline{CD} \perp \overline{AB}$

D is the mp of \overline{AB}

Prove: $\overline{CA} \cong \overline{CB}$

Statements	Reasons
1. $\overline{CD} \perp \overline{AB}$	1. Given
2. D is the mdpt. of \overline{AB}	2. Given
3. $\overline{AD} \cong \overline{BD}$	3. definition of midpoint
4. $\overline{CD} \cong \overline{CD}$	4. reflexive property
5. $\angle CDA$ and $\angle CDB$ are right angles	5. definition of perpendicular
6. $\angle CDA \cong \angle CDB$	6. all right angles are congruent
7. $\triangle CDA \cong \triangle CDB$	7. SAS
8. $\overline{CA} \cong \overline{CB}$	8. corresponding parts of congruent triangles are congruent

③



Given: $\angle P \cong \angle S$

O is the mp of \overline{PS}

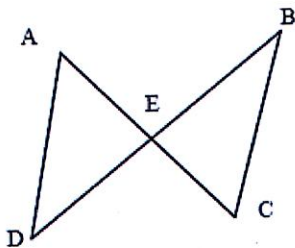
Prove: O is the mp of \overline{QR}

Statements

Reasons

- | | |
|--|--|
| 1. $\angle P \cong \angle S$ | 1. Given |
| 2. O is the mp of \overline{PS} | 2. Given |
| 3. $\overline{PO} \cong \overline{SO}$ | 3. def. of midpoint |
| 4. $\angle POQ \cong \angle SOR$ | 4. vertical angles are congruent |
| 5. $\triangle QPO \cong \triangle RSO$ | 5. ASA |
| 6. $\overline{QO} \cong \overline{RO}$ | 6. CPCTC |
| 7. O is the mp of \overline{QR} | 7. a midpoint divides a segment into 2 congruent parts |

④



Given: $\overline{AE} \cong \overline{BE}$

$\overline{DE} \cong \overline{CE}$

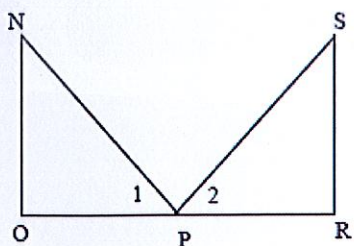
Prove: $\angle D \cong \angle C$

Statements

Reasons

- | | |
|--|--------------------------------|
| 1. $\overline{AE} \cong \overline{BE}$ | 1. Given |
| 2. $\overline{DE} \cong \overline{CE}$ | 2. Given |
| 3. $\angle AED \cong \angle BEC$ | 3. Vertical angles are \cong |
| 4. $\triangle DEA \cong \triangle CEB$ | 4. SAS |
| 5. $\angle D \cong \angle C$ | 5. CPCTC |

5



Given: $\overline{NO} \perp \overline{OR}, \overline{SR} \perp \overline{OR}$
 $\angle 1 \cong \angle 2, \overline{NO} \cong \overline{SR}$

Prove: $\overline{NP} \cong \overline{SP}$

Statements

Reasons

1. $\overline{NO} \perp \overline{OR}, \overline{SR} \perp \overline{OR}$,
 $\angle 1 \cong \angle 2, \overline{NO} \cong \overline{SR}$

1. Given

2. $\angle NOP$ and $\angle SRP$
are right angles

2. def. of perpendicular

3. $\angle NOP \cong \angle SRP$

3. all right angles are \cong

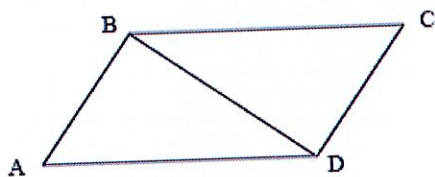
4. $\triangle NOP \cong \triangle SRP$

4. AAS

5. $\overline{NP} \cong \overline{SP}$

5. CPCTC

6



Given: $\overline{AB} \parallel \overline{CD}, \overline{BC} \parallel \overline{AD}$

Prove: $\overline{AD} \cong \overline{BC}$

Statements

Reasons

1. $\overline{AB} \parallel \overline{CD}, \overline{BC} \parallel \overline{AD}$

1. Given

2. $\angle DBA \cong \angle BDC$,
 $\angle ADB \cong \angle CBD$

2. alternate interior
angles are \cong when the
lines are parallel

3. $\overline{BD} \cong \overline{BD}$

3. Reflexive Property

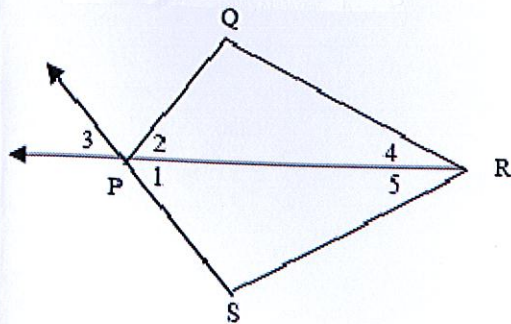
4. $\triangle ABD \cong \triangle CDB$

4. ASA

5. $\overline{AD} \cong \overline{BC}$

5. CPCTC

7



Given: $\angle 4 \cong \angle 5$, $\overline{QR} \cong \overline{SR}$

Prove: $\angle 2 \cong \angle 3$

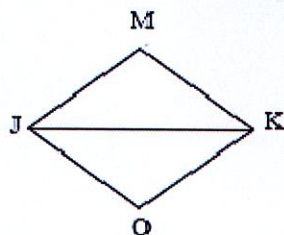
Statements

Reasons

1. $\angle 4 \cong \angle 5$, $\overline{QR} \cong \overline{SR}$
2. $\overline{PR} \cong \overline{PR}$
3. $\triangle QPR \cong \triangle SPR$
4. $\angle 1 \cong \angle 2$
5. $\angle 1 \cong \angle 3$
6. $\angle 2 \cong \angle 3$

1. Given
2. Reflexive Property
3. SAS
4. CPCTC
5. vertical angles are \cong
6. transitive prop.

8



Given: $\overline{MK} \cong \overline{OK}$

\overline{KJ} bisects $\angle MKO$

Prove: \overline{KJ} bisects $\angle MJO$

Statements

Reasons

1. $\overline{MK} \cong \overline{OK}$
2. \overline{KJ} bisects $\angle MKO$
3. $\angle MKJ \cong \angle OKJ$
4. $\overline{KJ} \cong \overline{KJ}$
5. $\triangle MKJ \cong \triangle OKJ$
6. $\angle MJK \cong \angle OKJ$
7. \overline{KJ} bisects $\angle MJO$

1. Given
2. Given
3. def. of bisect
4. Reflexive prop.
5. SAS
6. CPCTC
7. def. of bisect